

Comments on the Taiwan Stress Test National Report and Beyond

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New Taipei City, TAIWAN

Barrier can be lowered, but not

- English is NOT our mother language. Most cannot speak well. Majorities of documents are written in Chinese.
- TEPU formally requested presence of simultaneous translation. AEC rejected. (臺灣環保聯盟要求AEC提供即席翻譯, 被拒)
- TEPU also formally request supports to translate some crucial documents into English. AEC ignored.
(臺灣環保聯盟要求提供經費翻譯部份相關重要文件, 無回應)
- AEC's reasons: short of money, staffed with highly qualified translators, wish a failed communication? or prevent truth been told? ...
(原能會缺錢? 原能會員工翻譯綽綽有餘? 或不樂見溝通順暢? 試圖掩飾真相?)
- 20+ anti-riot polices staged in front of this 'NGO consultation meeting' venue – NGOs are mobs!?! (民間團體代表 = 暴民!)

In case this meeting fails, AEC is the one to blame.

Outline

- Concerns about Stress Test
- Some political background

Lack of mutual trust between citizens and government, evidences are:

- Problems of this AEC prepared Taiwan Stress Test National Report
- LIE: Did not send to Parliament
- Knowingly provide outdated information
- URG not evaluated yet
- I & C system backup – ‘nervous breakdown’ of no importance
- Plenty of overlook issues: volcanic activities, LMNP seismic details, possible plane crash, ...
- AEC responses to TPC violations, some examples

Hide its own incompetence? 掩飾無能?

About Stress Test

- Name: Comprehensive and transparent risk and safety assessments (廣博地, 透明地安全與風險評估)
- Targets (目標): natural hazards (天災), loss of safety systems (喪失安全系統), and severe accident management (重大核災因應)
- Not assessment of all safety issues (不是討論所有安全相關問題)
Q: Comprehensive Not cover enough (‘廣博’其實涵蓋十分有限)
Q: transparent? But no camera allowed (AEC indicate)?
- Purpose: Mere formality or acts of sincerity? (形式, 還是認真?)

Stress Test does not consider ...

(疑惑: 壓力測試不重...)

- Initial design (原始設計) --not all reactors created equal. Eg. CSNP are both GE BWR-4 with Mark - I containment,
- Age (廠齡) old reactors not the same as new one
- Cultural (文化)
- Management and Maintenances: past records (管理維修, 經驗與紀錄) – meet initial design basis or not
- Government Regulation: past records (監督機構表現) – look the other way or strong enforcement

Taiwan's Political Background (背景)

- Atomic Energy Council (tier 2) will be split into two, and downgrade to the Atomic Safety Council, tier-3. (原能會將被切割, 降級成為核能安全委員會)
- Possible national referendum on LMNP (4th NPP) near the end of this year (今年底可能舉行核四公投)
 - Pass referendum, the Law requires: >50% voters turnout + >50% 'yes'. (公投過關需要半數公民參與, 一半支持)
 - Pro-nuke ruling KMT propose: *"Do you agree that the construction of the Fourth Nuclear Power Plant should be halted and that it not becomes operational?"* (擁核的執政國民黨提出“你是否同意核四停建且不運轉?”)
- Will this Stress Test become propaganda tool **FOR nuclear** or indeed **promote nuclear safety**? (壓力測試是擁核者的宣傳工具, 還是倡議核電安全?)

AEC Lies !? (原能會說謊)

- July 4th 2013, Taiwan Legislators (LYs) notified ENSREG experts and commissioner that AEC report **must be reviewed** by LY before being recognized as ‘National Report’.

--- ‘Taiwanese Legislators’ letter to EU commissioners and ENSREG.pdf’

- July 8th 2013, AEC blames LYs ‘no request’ in the last LY session from February to June.

---2nd page of ‘AEC official statement on the schedule of EC peer review.pdf’, dated July 8th 2013.

- Truth is: the last LY session ran from February 26th to **May 31st**.
The AEC report published on **May 28th 2013**.

Q: Unwilling to be supervised? Is that better for nuclear safety?

AEC knowingly use old data

原能會故意用舊資料

Faults are much longer.

- In front of Legislators, AEC asked the TPC “*use 114km as the length of Shanchiao Fault in seismic assessment due December 2013.*” -- AEC report to LY, April 17th 2013.
- Not a word in the National Report

	<i>Shanchiao fault</i> 山腳斷層	<i>Hengchun Fault</i> 恆春斷層
AEC National Report (May 28 th 2013)	50.6 km	16 km
AEC Chair report to LY (April 17 th 2013)*	74 km	41 km

AEC Chair Report to LY (Apr. 2013)

立法院第8屆第3會期
經濟委員會

“Special Report on Overall Geological Survey of
operating NPPs and the Fourth NPP”

November 16th, 2012

營運中核電廠與核四廠之
地質總檢查專案報告

Chuen-Horng Tsai
Chairman, AEC

報告人：行政院原子能委員會
蔡春鴻主任委員

中華民國 102 年 4 月 17 日

April 17th, 2013

有關第一階段海、陸域地質調查作業，台電公司已於 101 年 6 月底完成初步調查成果，並經台電公司內部審查後，於 101 年 11 月 16 日向原能會提出調查結果，目前正由原能會聘請專家學者進行審核中。根據海、陸域地質調查初步結果可知：山腳斷層長度已由原先概估的 50.6 公里，進一步往外海延伸，總長度達 74 公里，且並不排除有向外海持續延伸之可能；而恆春斷層已由原先的陸地 16 公里，進一步往外海延伸，總長度估計達 41 公里。應原能會要求，台電公司已再提出擴大海域地質調查之規劃，以進一步調查

AEC Chair Report to LY (Apr. 2013)

山腳斷層的海域延伸段長度與特性，預定 103 年 8 月完成。儘管目前對於山腳斷層的海域延伸段與陸域斷層是否會有引發地震的連動性，或再向外海延伸至棉花峽谷等疑義，尚有待進一步釐清，但是，原能會基於安全保守性決策，要求先保守假設山腳斷層延伸至棉花峽谷總長度為 114 公里之基礎下進行第二階段耐震評估，並於 102 年年底前將結果提送原能會。為督促台電公司能如期依規劃完成山腳斷層擴大海域調查作業，原能會亦已於 102 年 4 月 8 日發函要求台電公司確實依規劃時程辦理，並將完成擴大海域調查案之決標作業列入未來核一、二廠機組大修後再起動管制項目，且後續之管制作業仍依前段之時程進行管制。

二、核四廠廠址與周遭環境地質議題與安全管制作為

對於外界關切核四廠興建廠址地質議題，原能會已就核四廠相關地質調查進行瞭解，包括於 70 年貝泰公司之核四廠貢寮廠址地質調查報告即已將相關斷層納入評估；83 年中國地質學會就核四廠址及其鄰近地區，再一次進行地質複查工作。

88 年 921 大地震後，行政院復要求經濟部能源委員會針對本次地震經驗及觀測資料進行

p.4, 1st para. Require TPC
“use 114km as the length
of Shanchiao Fault in
seismic assessment due
December 2013.”

AEC Chair Report to LY at April 17th 2013, has total of 6 pages only. Lack of \$ for translation?

Role of Atomic Energy Council – 2b

Faults are much closer.

- Shanchiao fault cut between CSNP and KSNPChina Sea. Distances between Shanchiao fault and CSNP, KSNP are 7 km (not 8 km stated in National Report) and 5 km (not mentioned at all), respectively.
-- “Special Report on Overall Geological Survey of operating NPPs and the Fourth NPP” by Ministry of Economic Affairs to the Economic Committee, Legislative Yuan (LY) on April 17th, 2013. Same session which AEC Chair Tsai participated.
- **Hengchun Fault found inside MSNP.**

MSNP(核三)

台灣電力公司

Figure 1. The satellite image of MSNP, lower left half of the map, with main entrance at the upper left corner and one side entrance on lower right corner. TR-S2-2 indicates the excavation site in question.

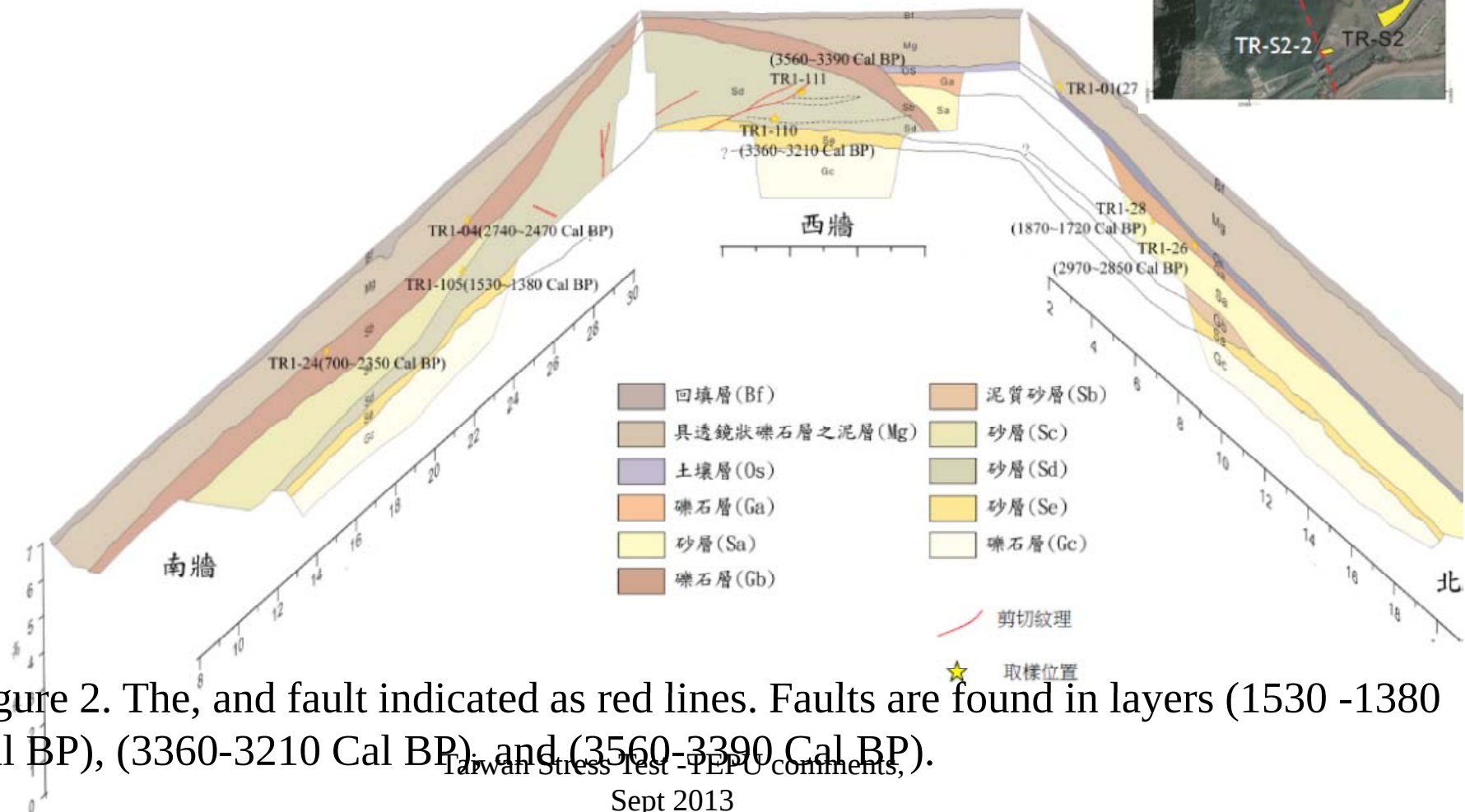
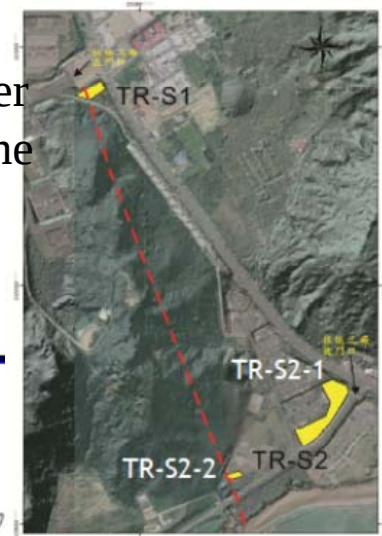


Figure 2. The, and fault indicated as red lines. Faults are found in layers (1530 -1380 Cal BP), (3360-3210 Cal BP), and (3560-3390 Cal BP).

Taiwan Stress Test - TEPU comments,

Sept 2013

AEC: Language, or mentality problem?

- AEC responses to outdated information
- “According to ENSREG stress test specifications, the *reference date* (參考日期) of National Report is June 30, 2011. ...”
- “The most recent findings will be included in the response to questions from peer reviewers.” (回覆意見中將更新) -- Why not update the National Report? (為何不更新國家報告?)
- Problematic language capability? if ‘reference date’ came from EU_Stress test specifications_0_0.pdf (看錯英文?) **Scary! What else AEC misunderstood all these years?** (這些年還看錯哪些?)
- Or, is it a mentality problem? (還是故意)

For existing plants, the reassessments shall refer to the plant as it is currently built and operated on June 30, 2011. For plants under construction, the reassessments shall refer to the licensed design.



發佈日期：2013-06-05

原能會審查斷然處置措施

原能會根本還未 審查斷然處置

原能會審查斷然處置措施之目的，是確認該措施之可行性與完整性，同時要求台電公司確認該措施能與既有相關程序書相互融合，確實避免爐心熔毀及放射性物質大量外釋，使環境和民眾受到事故的影響可以減到最低。

原能會在日本福島一廠核子事故發生後，即提出「國內核能電廠現有安全防護體制全面體檢」方案(100年4月19日經行政院核定)，要求國內核電廠參考福島事故經驗檢討安全防護現況，並加強對超過設計基準事故的因應能力。在上述方案之11項近期檢討議題中，包括針對日本福島一廠在事故期間指揮系統紊亂、對嚴重事故處置因應措施不夠完善等狀況，要求台電公司參照國際間普遍採用移動式電源與水源之彈性策略為因應的做法，加強國內核電廠因應事故的能力。

台電公司各核電廠在民國100年底已備妥並整備大量、多樣化的移動式設備(包括電源、水源、水泵等)，以因應嚴重事故，並經原能會審查確認。另台電公司為具體妥善應用上述設備，乃提出斷然處置措施，並著手進行各核電廠之模擬分析，根據各機組之設計與運轉特性，分析各種事故情況時必要採取之釋壓和注水時機與操作條件，確認控制爐心水位和維持燃料溫度在特定溫度之下的可行性，以便機組在緊急狀況時，能透過果決斷然執行反應器釋壓與注水程序，避免爐心熔毀及放射性物質大量外釋，使環境和民眾受到事故的影響可以減到最低。

原能會肯定台電公司提出斷然處置措施之做法，但仍必需經過嚴謹的專業審查程序來檢視該措施的有效性與完備性；同時原能會也要求台電公司須參考國際核能業界整合緊急運轉程序書(EOP)、嚴重事故管理指引(SAMG)及大範圍廠區受損救援指引(EDMG)指引，並納入多機組且超過設計基準之廠外事故，實施多樣化具彈性的策略(FLEX)的做法，確認斷然處置措施能與既有相關程序書相互融合、相輔相成。**原能會**將本著安全主管機關一向的立場，對本案進行嚴格的審查，使斷然處置措施確實能夠與相關救援指引結合，並發揮效果，達到共同維護核電安全的目標。

AEC on URG

- **Ultimate Response Guideline (URG)** only conceptual when National Report in print (May 28th 2013)
- URG can be found in nearly half of the National Report, as if it is vigorously evaluated by AEC.
- Fact: A statement released by AEC on June 5th, 2013 indicating that URG **WILL** be evaluated.

AEC response

- *“URG in National Report doesn’t automatically assume that it has passed rigorous evaluation by AEC nor the plant safety is warranted.”* -- Response to NGO comments.doc
- **AEC said NOTHING** when President Ma, Premier Jiang, many other high ranking officials, and TPC proudly said that Fukushima-like disaster NEVER will happen in Taiwan since TPC invent (?) URG, an absolute safety guarantee. (President Ma said to Michio Ishikawa on Jun 25th 2013)

I&C systems 儀控系統

- IAEA report: “*I&C systems are the nervous (nerve) system of a nuclear power plant*”- 核電廠的神經
- LMNP has 2 ABWR reactors, same as Kashiwazaki-Kariwa 6 and 7, with fully digitized I&C system. (核四完全數位化)

數位化可能出問題:

- IAEA concerns on possible common cause failures, cyber attacks and response to changing technologies.
- Whether all sensors, detectors, transmitters, and data transmission lines meet the temperature, radiation requirements of nuclear power plants, and their responses in case ‘beyond design basis’ extreme conditions occur.

Nuke nervous breakdown, important?

核電經神系統崩潰, 重不重要?

I&C backups (儀控的備用)

- Equally fully digitalized EPR is required by Finnish regulator to install a hard-wired backup system. (芬蘭要求另設類比儀控備用系統)
- Areva agreed to install hard-wired backup I & C to meet US NRC licensing requirement for its US EPR (美國也如此)
- **TEPU request** AEC (and TPC) explore the prospect of having hard-wired backup I&C system on LMNP.
- **AEC response:** LMNP has “*hard-wired physical switches capable to manually shut down the reactor.*” And I & C system is “*not covered under the ENSREG stress test specifications.*”

Other Overlook Issues-1 (遺漏1)

- **Volcanic Activities (火山活動), its interaction with seismic faults. (與地震相互影響)** -- Belousov, et al (2010) analyzed TVG(大屯火山系) deposits, and concluded TVG is volcanically active (活動的). Chen and Shen (2004) suggested submarine volcanic eruptions (海底火山爆發) also may pose potential threat to nuclear safety.
- **Plane crash (墜機)** December 1991, cargo plane of China Airline crashed at mountain 2km from KSNP. (華航客機墜毀在距核一廠2公里處)

Other Overlook Issues-2 (遺漏2)

- **LMNP seismic activity;** surrounded by Audi, Kungliao, Funchiao, and Chuchi faults, and 10+ submarine volcanoes nearby. And p.3 of the National Report “... *geological structure that does affect the site is the subducting slab in northeastern Taiwan*” ???
- **Possibility of losing instrument signals.** SFP Temp. and water level sensors are non-safety related system.
- **No emergency AC for SFP water makeup system.**
- **Event “heavy rainfall + earthquake + mudslide” shall be considered.**
(應評估暴雨+地震+土石流)
- **No consideration of filters when venting** (排氣沒濾網)
- **separate (backup) control room, in case events beyond DBE or DBF.** (應有獨立備用控制室)

Selected TPC LMNP violations

(臺電核四部份違規) -- why AEC did not mention this?

Date	Issue	Penalty (NT)
Apr. 2008	Unauthorized alternation of LMNP designs (395 items), incl. support for the emergency cooling water supply	Fine 500K
Nov. 2008	More unauthorized design alternation	Fine 3.5M
Jan 2012	More unauthorized design alternations (total about 1450 items)	Fine 15M

TPC does not care what AEC says! 原能會無法約束臺電.

Known Selected TPC LMNP violations (cont.)

(核四違規部份紀錄)

Date	Issue	Penalty (NT)
May 2007	Unauthorized removal of some containment concrete, and cut steel tendons short	Fine 300K
Dec. 2008	Welding performed by unqualified personnel, using unknown welding material, and not following procedures.	Fine 100K
May 2009	Inappropriate I&C of reactor 1 installation and FMCRD cable conduit installation.	Fine 400K

Taiwan Stress Test -TEPU comments.

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Inferior material, LMNP -1

偷工減料一

鍍鋅方式比較 資料來源:中華民國熱浸鍍鋅協會

電鍍鋅	方法	熱浸鍍鋅
0.002~0.0038公釐	鋅膜厚度	0.0762~0.127公釐
耐蝕年限		
0.18~0.68年	重工業地區	13.6~22.68年
1.33~2.54年	都市、海岸地區	50.8~84.67年
1.54~2.92年	田園地區	58.6~97.6年
2.5~4.75年	山間地區	95~158年
4~7.6年	乾燥地區	152~254年

■電鍍鋅管件氧化後外觀
顏色較亮。

■熱浸鍍鋅管件氧化後外觀
顏色較暗。

有毒氣體嗎？」管線採電鍍鋅，是因熱浸鍍鋅一公斤要十五、六元，電鍍鋅才四、五元，且在乾燥環境中，沒有不耐久問題。

台電

Hot-dip galvanized zinc conduit are replaced by electroplated zinc Tubing. TPC said trying to “save money” and “(nuclear plant) in dry environment, no problem”

Taiwan Stress Test -TEPU comments,
Sept 2013

資料來源：蘋果日報2008/2/5，A4

Inferior material – 2 偷工減料二

Meet Design Basis? 符合原設計?

Design requires material of gasket stand up to 1000C, 'no neoprene' specifically. TPC allows neoprene gasket installed. 應用耐1000C高溫之碳纖維墊片，設計特別標示不可用Neoprene材質



資料來源：蘋果日報2008/2/5，A4

台電核四工程督導組組長林俊隆表示，雖然neoprene高溫會釋出有毒氣體，但在高溫環境下，人都死了還怕有毒氣體嗎？「管線採電鍍鋅，是因熱

TPC representative: “in high temp. situation, everyone dies who is afraid of toxic fume (emitted when neoprene burns)”

Stress Test

Purpose:

A formality or improve nuclear safety?

(形式, 還是改善核安?)

My point:

AEC for the former (原能會只注意形式)

ENSREG for ...